

Docket No. 61755(51035)

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

5 Applicants: J.P. Maye  
Serial No.: 09/520,004  
Filed: February 10, 2003  
For: PROCESS FOR CONTROLLING MICRO-ORGANISMS IN AN AQUEOUS  
PROCESS MEDIUM

10 Examiner: Vera Stulli  
Art Unit: 1617

Mail Stop: Amendment  
Commissioner for Patents

15 P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**DECLARATION UNDER 37 C.F.R. 1.132**

20 I, Shaun O'Riley, a citizen of the United States of America, hereby declare as follows:

1. I am Operations Manager and Lab Manager at Golden Triangle Energy LLC, 15053  
Highway 111, Craig, MO 64437.

25 2. I understand that this declaration is submitted in support of pursuing a U.S. patent on  
the subject matter described and claimed in the patent application U.S.S.N. 09/520,004, filed on

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February 10, 2003 and otherwise identified above.

3. I have read and understood the Office Action dated March 8, 2007 and the references cited in the Office Action in the above case.

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4. The following experiments or treatments were conducted by me or under my supervision, to compare the effect of administration of hop acids in fuel ethanol production.

5. We performed fermentation processes to produce fuel ethanol wherein the antibiotics virginiamycin ("V-100") or virginiamycin/streptomycin/penicillin blend ("V-50") are administered pre-fermentation during the process in the yeast propagation vessel to inhibit gram-positive bacteria infection in the fuel ethanol production process. Such infection typically leads to reduced ethanol yields, or in severe cases, can lead to "stuck" fermentation, thus resulting in wasted materials and increased clean up costs and loss of productivity.

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6. We then performed the fermentation processes to produce fuel ethanol; however substituting hop acids (e.g., isoalpha hop acids) for the V-100 or V-50 antibiotics. This substitution was the only significant change in the processes. In laboratory tests we observed a 1.3% increase (which in the fuel ethanol industry is significant) in fuel ethanol yield using hop acids as a substitute for antibiotics. In actual industrial production scale, in a same quarter comparison of production yields, with this substitution as the only change in production techniques, we observed higher production (on the order of ca. 30,000 gallons) of fuel ethanol in the runs using hop acids relative to the runs using V-100 or V-50 antibiotics.

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7. These results indicate that administration of hop acids in the form and manner described above provided a surprising and unexpected increase in fuel ethanol production on a volume by volume basis compared to results using antibiotics, and further unexpected was the

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observation that this increased fuel ethanol production was made using fewer bushels of corn feedstock in the process (on the order of ca. 18,500 bushels less corn).

8. I, the undersigned Shaun O'Riley, further declare that all statements made herein of my own knowledge are true and that all statements made upon information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 101 of Title 18 of the United States Code and that such willful false statement may jeopardize the validity of the above identified application or any patent issuing thereon.

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By: Shaun B. O'Riley

Shaun O' Riley

Date: 9-7-07

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# BetaTec

hop products, Inc.

[www.betatechopproducts.com](http://www.betatechopproducts.com)

BetaTec provides quality fermentation products to the ethanol industry in the form of natural hop products. One product BetaTec offers the ethanol industry is IsoStab™, an all natural hops-based product that controls gram-positive bacteria during fermentation. For ethanol producers, this is important for two reasons; reduced bacteria infections in distilleries leads to increased ethanol yields, and using an antibiotic-free product allows distillers to sell antibiotic free Distillers Grains for use as animal feed.

When Shaun O'Riley of Golden Triangle Energy Cooperative, based in Craig, Missouri, first heard the claims made about IsoStab™, he responded in a way belittling a Missourian. He said "Show me."



Shaun O'Riley

"The IsoStab™ product not only kills bacteria, but enhances the yeast growth which equals more alcohol production." With results like this, this Show-Me State ethanol producer can be sure they made the right choice when they switched to IsoStab™.

"When Bill Pope, of BetaTec, left our offices, I told Pat Long, the lab assistant at Golden Triangle Energy, that he'd hear claims like this over and over from sales reps. So we set out to discover for ourselves if this product was effective," O'Riley explained. "This led to a series of experiments in Golden Triangle's labs. When the company compared their historical results using antibiotics with the all natural, patent-pending, IsoStab™ product, they found the antibacterial in IsoStab™ did indeed result in more alcohol."

Test results in the lab indicated a 0.20 increase in alcohol production in a volume by volume basis compared to the results using antibiotics. Since IsoStab™ is priced lower than the antibiotics needed to do the same job, Golden Triangle Energy determined it was worth using in production.

"When we finished our laboratory testing, I have to admit, I was surprised by the

results," said O'Riley. But even more important than the successful test results were the improvements in actual production. In a same quarter comparison of 2004 and 2005, with the change from antibiotics to IsoStab™ as the only change in production techniques, Golden Triangle Energy produced more ethanol gallons using fewer bushels of corn. This is an outstanding improvement.

But Golden Triangle Energy doesn't only sell ethanol. The sale of Dried Distillers Grain (DDG) and Wet Distillers Grain (WDG) is an important part of the distilling industry. As the general public voices more concerns about antibiotics in animal feed, the ability to provide antibiotic-free Distillers Grains allows alcohol producers to specifically target clients who want an antibiotic-free product. For distillers who use IsoStab™, there is never a need to remove antibiotics from the Distillers Grains, since no antibiotic is ever added.

The market for ethanol distillers' products is changing. As oil prices continue to rise, consumer demand for and interest in ethanol fuels increases. Consumer interest in antibiotic-free meats is increasing as well. Using IsoStab™, Golden Triangle Energy achieves efficient and profitable results while meeting the demands of consumers today and in the future.